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Making the Case for Changing U.S. Policy regarding Highly Skilled Immigrants

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MAKING THE CASE FOR CHANGING U.S. POLICY REGARDING HIGHLY SKILLED IMMIGRANTS

*Peter H. Schuck & John E. Tyler**

ABSTRACT

Highly skilled immigrants to the United States (“HSIs”) have helped catalyze American economic growth and advances in human welfare by generating knowledge and innovations that have spawned new products, services, systems, jobs, and wealth. A number of studies document that HSIs are disproportionately innovative. Similarly, HSIs are more likely to start and grow companies, which are a vital source of new jobs. Unfortunately, current U.S. policy regarding HSIs—mostly relating to H-1B and EB series visas—inhibits our ability to more fully benefit from the growth-enhancing contributions HSIs can make. In addition to tinkering around the edges of existing policy, more far-reaching reforms are required to produce larger gains. We propose to (1) guarantee at least provisional visas for foreign-born graduates of science, engineering, technology, or math programs at American universities; (2) encourage state and local communities to actively advertise for and recruit HSIs with characteristics, experiences, and skills targeted to particular economic development opportunities, such as life sciences, clean energy, or other disciplines; (3) create a new provisional visa for HSI entrepreneurs who create jobs and growth; and (4) adopt new policy mechanisms, such as a point system or an auction of HSI visas, better suited to attract high-productivity individuals and promote economic growth.

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INTRODUCTION

Human curiosity expands our understanding of phenomena relating to science, technology, engineering, and math (“STEM”), among other fields. Those understandings generate new knowledge and innovations, which may in turn lead to new products, services, productive systems, and jobs that contribute to economic growth and advances in human welfare. Stated differently, knowledge is iterative and dynamic; it is limited only by our capacity to comprehend more, ask new questions, and dedicate the neces-

sary resources, time, and energy. Such knowledge drives our economy but depends on a critical mass of engaged people.

Highly skilled immigrants (“HSIs”) to the United States, particularly foreign-born workers with graduate degrees in STEM fields, have catalyzed and expanded U.S. innovation, economic growth, jobs, wealth creation, and the resulting advances in human welfare. Their inventions, innovative approaches, and new companies are legion. America has been attractive to HSIs and other innovators at least in part because of its fundamental freedoms, market-friendly values, and reliable infrastructure. But this past success in attracting HSIs is no guarantee of the United States’ future ability to attract or retain such immigrants. This gives rise to three questions.

First, could our nation have achieved greater innovation, economic growth, jobs, and advances in human welfare if U.S. policy had focused more deliberately on potential contributions from HSIs? Second, how can the United States ensure that we continue to benefit from HSIs in the face of increased competition from other countries seeking to attract (or retain) them? Finally, is our economic leadership and future being compromised by clinging to old policies not well-adapted to current and future circumstances?

In this article, we marshal data and evidence demonstrating that HSIs offer innovative and entrepreneurial talents, particularly in STEM fields. We also show that new policy approaches could better deploy these talents and result in economic growth. We advocate several changes, including: making targeted efforts to recruit people with preferred characteristics, experience, and skills for starting and growing companies and making permanent or at least provisional visas available to them; guaranteeing that HSIs who receive degrees from U.S. universities in STEM disciplines, particularly from graduate programs, receive such visas; creating new visa categories for HSI entrepreneurs; and adopting a new system for granting such visas based on points or auctions that reward HSIs who can advance our nation’s economic objectives, especially innovation, entrepreneurship, and jobs.

Part I identifies three threats to our economy that might be alleviated by new policies regarding HSIs. Part II summarizes relevant, current U.S. policies regarding HSIs, namely, the H-1B and EB series visas. Part III advances specific policy proposals to increase economic growth, innovation, jobs, and human welfare.

I. HSIS CAN HELP EXPAND THE U.S. ECONOMY, ADDRESS INCREASED COMPETITION, AND MEET DEMANDS FOR HIGHLY SKILLED LABOR

More effective policies regarding HSIs can affect and help address at least three macro-level economic problems for the United States: sluggish economic growth and a need for new firms and jobs; growing competition from increasingly sophisticated and productive countries around the globe; and a supply shortage being created by an aging STEM population and not enough native STEM graduates. We now discuss each of these problems and their relationship to U.S. policy regarding HSIs.¹

A. HSIs are Innovative and Entrepreneurial

HSIs innovate and engage in entrepreneurial activity, particularly in STEM industries, at levels disproportionate to their presence in the population and relative to native-born Americans.

1. *HSIs as Innovators: Education Levels and Patenting Activity*

Researchers often consider two indicators of innovation: education in a STEM discipline² and patenting activity.³ They find a correlation between advanced education in a STEM field and “high rates of entrepreneurship and innovation.”⁴ They also find high rates of patenting activity by for-

1. Although many studies show that legal immigration in general improves job growth and economic development, particularly in disadvantaged areas, we focus here on HSIs. See RICHARD T. HERMAN & ROBERT L. SMITH, IMMIGRANT, INC.: WHY IMMIGRANT ENTREPRENEURS ARE DRIVING THE NEW ECONOMY (AND HOW THEY WILL SAVE THE AMERICAN WORKER) 125-27 (2010).

2. See discussion *infra* note 4 and accompanying text.

3. See JENNIFER HUNT & MARJOLAINE GAUTHIER-LOISELLE, HOW MUCH DOES IMMIGRATION BOOST INNOVATION? 1 (2009); William R. Kerr & William F. Lincoln, *The Supply Side of Innovation: H-1B Visa Reforms and U.S. Ethnic Invention* 4 (Nat'l Bureau of Econ. Research, Working Paper No. 15768, 2010), available at <http://hbswk.hbs.edu/item/6097>.html. Of course, patenting is not the only evidence of innovation, nor is it the only method by which to maximize the usefulness of innovative products, services, or processes. Still, it can be an important data point in the analysis. See generally John E. Tyler III, *Advancing University Innovation: More Must Be Expected—More Must Be Done*, 10 MINN. J. L. SCI. & TECH. 143 (2009).

4. VIVEK WADHWA ET AL., EWING MARION KAUFFMAN FOUND., EDUCATION, ENTREPRENEURSHIP, AND IMMIGRATION: AMERICA'S NEW IMMIGRANT ENTREPRENEURS, PART II, at 14 (2007), [hereinafter WADHWA, ENTREPRENEURS, PART II]; see also *id.* at 4. Founders of engineering and technology companies between 1995 and 2005 were consistently highly educated. See *id.* at 2. Ninety-six percent had bachelor's degrees. See *id.* More impressively, 74% of immigrant founders had graduate or post-graduate degrees and more than one-fourth had at least a doctorate. See *id.* at 2-3. This figure compares to about only 50% of native-born founders with graduate degrees. See Vivek Wadhwa et al., *Skilled Immigration and Economic Growth*, 5 APPLIED RESEARCH IN ECON. DEV. 6, 10 (2008) [hereinafter

eign-born inventors relative to their presence in the population as a whole and in the workforce more specifically.⁵

Other researchers find evidence of innovation by non-citizen residents at a rate twice their presence in the population and workforce.⁶ They also find that immigrants with bachelor's degrees were granted patents at twice the rate of native-born Americans with bachelor's degrees; the difference rises to almost three times the rate when comparing those with graduate degrees.⁷ The differences in patenting were less pronounced when comparing immigrant scientists and engineers with native-born scientists and engineers, but immigrants still received about 20% more patents than native-born scientists and engineers.⁸

In addition, researchers found a direct correlation between increases in the number of H-1B visas and increases in patent applications.⁹

Some commentators contend that HSIs crowd out native-born STEM innovation by interfering with access to graduate education,¹⁰ taking jobs,¹¹

Wadhwa, *Skilled Immigration*]. Three-quarters of these immigrant founders had their highest degrees in a STEM discipline. See WADHWA, *ENTREPRENEURS, PART II*, *supra*, at 3. Over one-half received their highest degree from a U.S. university. *Id.*

5. See HUNT & GAUTHIER-LOISELLE, *supra* note 3, at 1-5, 10-11, 13-15, 19-21, tbl.1; see also STUART ANDERSON & MICHAELA PLATZER, NAT'L VENTURE CAP. ASS'N, *AMERICAN MADE: THE IMPACT OF IMMIGRANT ENTREPRENEURS AND PROFESSIONALS ON U.S. COMPETITIVENESS* 6, 12 (2006); ROBERT W. FAIRLIE, SMALL BUS. ADMIN., OFFICE OF ADVOCACY, *ESTIMATING THE CONTRIBUTION OF IMMIGRANT BUSINESS OWNERS TO THE U.S. ECONOMY* 7, 9, 11 tbl.2 (2008); HERMAN & SMITH, *supra* note 1, at 21.

6. See HUNT & GAUTHIER-LOISELLE, *supra* note 3, at 1, 4, 13; see also HERMAN & SMITH, *supra* note 1, at 513 (stating that immigrants are about 12% of the population). Hunt and Gauthier-Loiselle analyzed responses to the 2003 National Survey of College Graduates and found that non-citizen residents of the U.S. were integral to 24% of the reported patent activity between 1998 and 2003—about double their presence in the 2000 population generally and the workforce more specifically. See FAIRLIE, *supra* note 5; HUNT & GAUTHIER-LOISELLE, *supra* note 3, at 1-5, 10-11, 13-15, 19-21, tbl.1. This rate of innovation is also about two and a half times the proportion of legal immigrants in the United States, even though immigrants with college degrees comprised only 3.5% of the overall population in 2000. See HUNT & GAUTHIER-LOISELLE, *supra* note 3, at 13; see also ANDERSON & PLATZER, *supra* note 5.

7. See HUNT & GAUTHIER-LOISELLE, *supra* note 3, at 10-11, tbl.1.

8. See *id.* at 11, tbl.1.

9. See Kerr & Lincoln, *supra* note 3, at 1-2. For instance, non-citizen U.S. residents were named on 7.3% of patent applications filed from the United States with the World Intellectual Property Organization in 1998. See VIVEK WADHWA ET AL., *AMERICA'S NEW IMMIGRANT ENTREPRENEURS, PART I*, at 27 & fig.12 (2007) [hereinafter WADHWA, *ENTREPRENEURS, PART I*]. The rate increased to 13.8% in 2003, rose dramatically to 23.5% in 2005, and rose again to 24.2% in 2006. *Id.* These increases correspond to a doubling of the number of H-1B visas available from 1999-2000, and a tripling in the number from 2001-2003.

10. See Neeraj Kaushal & Michael Fix, *The Contributions of High-Skilled Immigrants*, INSIGHT (Migration Pol'y Inst., Wash. D.C.), July 2006, at 13; George J. Borjas, *Do Foreign Students Crowd Out Native Students from Graduate Programs?* 4, 7-8, 10 (Nat'l Bureau of

and depressing wages.¹² Others, however, find no evidence that increasing the number of H-1B visas reduces innovation by non-immigrant researchers, as measured by patent applications.¹³ Researchers have also found either an absence of such crowding out, or a crowding in or positive spillover effect.¹⁴ This research shows that increasing the number of H-1B visas benefits native-born workers and the broader population by helping achieve critical mass in researching specialized areas, providing skills that complement native-born researchers, and contributing to increased output, commercialization, or usefulness of the patents' subjects, which also benefits the native-born population.¹⁵

Ultimately, whatever crowding out may occur must be weighed against the widely-distributed, substantial benefits produced by the quickened pace of scientific progress, discovery, and other benefits derived from foreign-born people creating and pursuing their ideas and innovations here.¹⁶ Policy changes that encourage HSIs to come to and stay in the United States to work and start companies are likely to increase overall U.S. innovation and, by extension, economic growth, job creation, and human welfare.

Econ. Research, Working Paper No. 10349, 2004) [hereinafter Borjas, *Foreign Students*], available at <http://www.nber.org/papers/w10329>.

11. See Kaushal & Fix, *supra* note 10, at 14.

12. See George J. Borjas, *Immigration in High Skill Labor Markets: The Impact of Foreign Students on the Earnings of Doctorates* 4, 8, 28, 31 (Nat'l Bureau of Econ. Research, Working Paper No. 12085, 2006) [hereinafter Borjas, *Impact*], available at http://www.nber.org_papers/w12085.

13. See Vivek Wadhwa, *Don't Blame H-1B Workers for Woes*, BUS. WK. (Feb. 10, 2009, 12:01 AM), http://www.businessweek.com/technology/content/feb2009/tc2009029_333899.htm [hereinafter Wadhwa, *Woes*].

14. See Kerr & Lincoln, *supra* note 3, at 1-3.

15. See HUNT & GAUTHIER-LOISELLE, *supra* note 3, at 1-2. Hunt and Gauthier-Loiselle found that a 1% increase in immigrant college graduates is associated with a 12% to 15% increase in total patenting per capita. This finding implies a spillover effect. *See id.* at 14, 19-21. Their correlations are even more substantive for graduate education generally, and for science and engineering fields specifically. *See id.* at 5, 15, 19; *see also* PIA M. ORRENIUS & MADELINE ZAVODNY, *BESIDE THE GOLDEN DOOR: U.S. IMMIGRATION REFORM IN A NEW ERA OF GLOBALIZATION* 49, 51, 52, 65, 123 n.43 (2010) (discussing the spillover effect); Kaushal & Fix, *supra* note 10, at 14 (discussing the supply of immigrant talent); Kerr & Lincoln, *supra* note 3, at 2, 4 (discussing the effects of high-skilled immigration); Wadhwa, *Woes*, *supra* note 13 ("The critical mass of knowledge workers at worst did no harm to non-immigrant knowledge workers" and at best such workers benefited from "intellectual cross-pollination and interaction with foreign workers plying the same trade.").

16. See ARLENE HOLEN, TECH. POL'Y INST., *THE BUDGETARY EFFECTS OF HIGH-SKILLED IMMIGRATION REFORM* 3 (2009); HUNT & GAUTHIER-LOISELLE, *supra* note 3; VIVEK WADHWA, ET AL., EWING MARION KAUFFMAN FOUND., *INTELLECTUAL PROPERTY, THE IMMIGRATION BACKLOG, AND A REVERSE BRAIN DRAIN: AMERICA'S NEW IMMIGRANT ENTREPRENEURS*, PART III, at 31 (2007) [hereinafter WADHWA ET AL., *ENTREPRENEURS*, PART III]; DARRELL M. WEST, *BRAIN GAIN: RETHINKING U.S. IMMIGRATION POLICY* 2, 13 (2010); Kaushal & Fix, *supra* note 10, at 14; Kerr & Lincoln, *supra* note 3.

2. *HSIs as Entrepreneurs: Starting and Growing Firms and Creating Jobs*

HSIs have contributed significantly to U.S. economic growth over time,¹⁷ and they have a “striking propensity” to start and grow companies, particularly in technology fields.¹⁸ HSIs have been integrally involved with founding about one-quarter of the technology and engineering companies started between 1995 and 2005 that comprise the Dun & Bradstreet Million Dollar database.¹⁹ Other research corroborates this 25% ratio, including studies of Silicon Valley,²⁰ biotech companies in New England,²¹ and publicly traded companies that receive venture capital.²²

The consistent finding that immigrants create about one-quarter of businesses in the subject pools is even more impressive when immigrants are considered relative to their general presence in the population and workforce. Immigrants start companies at twice their ratio in the U.S. popula-

17. See WADHWA, *ENTREPRENEURS*, PART II, *supra* note 4.

18. See ANDERSON & PLATZER, *supra* note 5, at 5.

19. See Vivek Wadhwa, *A Reverse Brain Drain*, ISSUES IN SCI. & TECH., Spring 2009, at 47 [hereinafter Wadhwa, *Reverse Brain Drain*]; see also FAIRLIE, *supra* note 5, at 1; HERMAN & SMITH, *supra* note 1, at 187; HUNT & GAUTHIER-LOISELLE, *supra* note 3; WADHWA, *ENTREPRENEURS*, PART I, *supra* note 9, at 4, 11, 35; WADHWA, *Skilled Immigration*, *supra* note 4, at 8; *H-1B Visas by the Numbers: 2010 and Beyond*, NFAP POLICY BRIEF (Nat'l Found. for Am. Policy, Arlington, Va.), Mar. 2010, at 14 [hereinafter *H-1B Visas by the Numbers*].

The Dun & Bradstreet Million Dollar database consists of companies that have more than \$1 million in sales, and employ twenty or more people or have branches with a total of at least fifty employees. See WADHWA, *ENTREPRENEURS*, PART I, *supra* note 9, at 8; Wadhwa, *Skilled Immigration*, *supra* note 4, at 7. It was estimated that companies with at least one immigrant founder generated \$52 billion in revenue and employed 450,000 workers in 2005. See FAIRLIE, *supra* note 5, at 25; HERMAN & SMITH, *supra* note 1, at 187; WADHWA, *ENTREPRENEURS*, PART I, *supra* note 9, at 4, 11, 35; *H-1B Visas by the Numbers*, *supra*; Wadhwa, *Reverse Brain Drain*, *supra*.

20. Chinese and Indian immigrants had key roles in starting about one-fourth of the companies in Silicon Valley between 1980 and 1998. See WADHWA, *ENTREPRENEURS*, PART I, *supra* note 9, at 3; Wadhwa, *Skilled Immigration*, *supra* note 4, at 6-7; see also AnnaLee Saxenian, *Silicon Valley's New Immigrant High-Growth Entrepreneurs*, 16 ECON. DEV. Q. 20, 24 (2002), available at <http://edq.sagepub.com/content/16/1/20>.

21. According to a 2007 study by the Immigration Learning Center, immigrants also helped found 25.7% of the biotech companies in New England (mostly in Massachusetts), even though immigrants comprised only about 14.4% of the relevant population. See DANIEL J. MONTI ET AL., IMMIGRANT LEARNING CTR., IMMIGRANT ENTREPRENEURS IN THE MASSACHUSETTS BIOTECHNOLOGY INDUSTRY 4, 10 (2007).

22. Anderson and Platzer reached similar conclusions in a study about publicly traded companies started between 1990 and 2005 that took venture capital. In 25% of the companies studied, immigrants formed part of the founding teams. ANDERSON & PLATZER, *supra* note 5, at 13. That percentage dropped by only 2% when they extended the study back to 1980. See *id.* In 2005, those companies had a market capitalization of about \$500 billion and revenue of more than \$130 billion. See *id.* at 11, 13.

tion, twice their share of the U.S. workforce, and more than two and a half times their share of the overall population.²³ These ratios may even *understate* immigrants' entrepreneurial activity for at least two reasons: the lag effect, and the fact that some studies show even higher rates of firm formation by immigrants.

a. Lag Effect

It would be unusual for immigrants to found their companies in the year in which they arrive in the United States, particularly because most immigrants come here to study or work, rather than to start companies.²⁴ Further, it generally takes time for the ideas, networks, and other entrepreneurial factors to coalesce and motivate visa holders to start a company.²⁵ For these reasons, it would probably be more accurate to compare immigrants as founders or co-founders of companies begun between 1995 and 2005 with the proportion of immigrants in the population in earlier years, such as 1990, when immigrants were less than 8% of the overall U.S. population,²⁶ or 1995, when they were just over 9% of the population.²⁷ According to such a comparison, immigrants arguably founded companies at about three times the rate of their overall presence in the United States during the relevant years.

23. Immigrants make up only about 12% of the overall population. See HERMAN & SMITH, *supra* note 1, at 13; HUNT & GAUTHIER-LOISELLE, *supra* note 3. Their percentage of presence in the U.S. workforce is similar. See FAIRLIE, *supra* note 5, at 9. Legal immigrants comprised just under 9% of the U.S. population in 2008. See ANDERSON & PLATZER, *supra* note 5, at 12; U.S. CENSUS BUREAU, 2006-2008 AMERICAN COMMUNITY SURVEY 3-YEAR ESTIMATES: SELECTED CHARACTERISTICS OF THE NATIVE AND FOREIGN-BORN POPULATIONS (2008), http://factfinder.census.gov/servlet/STTable?_bm=y&-geo_id.=01000US&-qr_name=ACS_2008_3YR_G00_S0501&-ds_name=ACS_2008_3YR_G00_.

One study showed that immigrants started businesses at a rate of about 530 per 100,000 immigrants each month, compared with 280 per 100,000 native-born people each month—just under a two-to-one ratio. See HERMAN & SMITH, *supra* note 1, at 15. According to another study, immigrants are 30% more likely than native-born people to start a business. See FAIRLIE, *supra* note 5, at 31.

24. See ANDERSON & PLATZER, *supra* note 5, at 17; HERMAN & SMITH, *supra* note 1, at 193 fig.A.13; WADHWA, ENTREPRENEURS, PART II, *supra* note 4, at 8.

25. See Herbert J. Schuetze & Heather Antecol, *Immigration, Entrepreneurship and the Venture Start-up Process*, in THE LIFE CYCLE OF ENTREPRENEURIAL VENTURES 107, 118, 121, 128 (Simon C. Parker ed., 2009).

26. STEVEN A. CAMAROTA, CTR. FOR IMMIGRATION STUDIES, IMMIGRANTS IN THE UNITED STATES, 2007: A PROFILE OF AMERICA'S FOREIGN-BORN POPULATION 4 fig.2 (2007).

27. CAMAROTA, *supra* note 26, at 8 tbl.2.

b. *Other Research*

Some studies suggest that immigrants have participated in founding substantially more than 25% of relevant companies; indeed, some data suggests double that rate.²⁸ If these higher rates are accurate, and if the lag effect is ignored so that 2008 is the relevant year for comparing the U.S. immigrant population (12%), workforce (12%), and legal presence in the population (9%), then the rate of immigrants involved in founding companies is three to five times their presence in the relevant comparison set. If the lag effect is factored in along with these studies so that the relevant population comparison years are 1990 and 1995, the relative rate instead becomes five to six and a half times their presence.

This phenomenon is critical for our nation's economic growth because new firms disproportionately increase employment. Census data from 2007 suggests that firms between one and five years old account for about two-thirds of net new job creation, with firms between three and five years old generating about 10% of net new jobs even though they comprise less than 1% of the total number of companies.²⁹ Because about one-third of all new firms close by their second year, and roughly half do not survive beyond five years, firms that do reach age five are largely responsible for that net new job creation.³⁰ Obviously, a continuous procession of large numbers of new firms is needed to sustain or even expand that job creation trend. Yet in recent decades, the United States has experienced a remarkably consistent pattern of about 500,000 new firm starts each year even in the face of sometimes sharp changes in economic conditions and markets and the presence of longer cycle changes in population and education.³¹

28. Wadhwa and Saxenian updated Saxenian's 1999 study and found that over 52% of technology and engineering companies started in Silicon Valley between 1995 and 2005 had at least one immigrant founder. *See* WADHWA, *ENTREPRENEURS, PART I*, *supra* note 9, at 5. When studying a sample of 340 privately held, venture-backed companies, Anderson and Platzer also learned that immigrants played key roles in starting 47% of them. *See* ANDERSON & PLATZER, *supra* note 5, at 17. Finally, the authors of the Immigrant Learning Center's study of New England's biotechnology industry suggest that foreign-born people could have had a role in founding up to 40% of the companies, instead of only 25.7% of them. *See* MONTI ET AL., *supra* note 21, at 10.

29. *See* DANE STANGLER, EWING MARION KAUFFMAN FOUND., *HIGH-GROWTH FIRMS AND THE FUTURE OF THE AMERICAN ECONOMY* 5 (2010); DANE STANGLER & ROBERT E. LITAN, EWING MARION KAUFFMAN FOUND., *WHERE WILL THE JOBS COME FROM?* 6 & fig.3 (2009).

30. *See* STANGLER & LITAN, *supra* note 29, at 5-6. These firms contributed an average of four jobs per firm per year, and about eight million of the twelve million new jobs added in 2007. *See id.* at 6.

31. *See* DANE STANGLER & PAUL KEDROSKY, EWING MARION KAUFFMAN FOUND., *EXPLORING FIRM FORMATION: WHY IS THE NUMBER OF NEW FIRMS CONSTANT?* 3 (2010). Stangler and Kedrosky analyzed the Census Bureau's Business Dynamics Statistics database

United States economic and policy interests demand that we find ways to increase the number of firm starts and grow their survival rates to and past year five. Attracting and retaining entrepreneurial HSIs in the U.S. economy could help achieve these ends because the data shows that HSIs create more new firms, add more net new jobs, thereby contributing to the growth of mature firms.

B. Other Countries Have Begun Winning the Competition for HSIs

Competition in STEM industries is increasing around the globe, endangering U.S. leadership in innovation.³² Other countries have improved infrastructure³³ and educational quality,³⁴ provided attractive environments for professional growth, development, and the resulting career advancement;³⁵ and conducted more sophisticated research and development leading to the advancement of products and services.³⁶ Although many of the factors that contribute to this competition and affect U.S. stature are beyond our control,³⁷ there is much that policymakers can do, including targeting policy to attract and retain HSIs most likely to contribute to economic growth.³⁸

Science and technology are no longer the exclusive province of developed nations: "Governments in many parts of the developing world have come to view science and technology as integral to economic growth and

and found that a median of about 500,000 new firms were started each year from 1977 to 2005. *See id.* at 5 & fig.3. The data shows very little variance from year to year, changing only about 3-6% in any given year. *See id.* Data from the Kauffman Index of Entrepreneurial Activity and the Panel Study of Entrepreneurial Dynamics show similar patterns of consistency. *See id.* at 6.

32. *See* NAT'L SCI. FOUND., NSB 10-01, SCIENCE AND ENGINEERING INDICATORS 2010, at O-3 (2010); ORRENIUS & ZAVODNY, *supra* note 15, at 55; Benson Honig et al., *Preface* to TRANSNATIONAL AND IMMIGRANT ENTREPRENEURSHIP IN A GLOBALIZED WORLD, at xvii-xxiv (Benson Honig et al. eds., 2010); Ivan Light, *Forward* to TRANSNATIONAL AND IMMIGRANT ENTREPRENEURSHIP IN A GLOBALIZED WORLD, at ix-xiv (Benson Honig et al. eds., 2010).

33. *See* NAT'L SCI. FOUND., *supra* note 32, at O-3, O-19.

34. *See* BEN WILDAVSKY, THE GREAT BRAIN RACE: HOW GLOBAL UNIVERSITIES ARE RESHAPING THE WORLD 4 (2010); Holiday Hart McKiernan & Tim Birtwistle, *Making The Implicit Explicit: Demonstrating the Value Added of Higher Education by a Qualifications Framework*, 36 J.C. & U.L. 511, 514-15 (2010).

35. VIVEK WADHWA ET AL., EWING MARION KAUFFMAN FOUND., AMERICA'S LOSS IS THE WORLD'S GAIN: AMERICA'S NEW IMMIGRANT ENTREPRENEURS, PART IV, at 3-4, 18 (2009) [hereinafter WADHWA, ENTREPRENEURS, PART IV].

36. *See* Wadhwa, *Reverse Brain Drain*, *supra* note 19, at 46.

37. *See* Peter H. Schuck, *The Morality of Immigration Policy*, 45 SAN DIEGO L. REV. 865, 875 (2008) [hereinafter Schuck, *Morality*].

38. *See* WEST, *supra* note 16, at 13, 40, 152-53; Kaushal & Fix, *supra* note 10, at 1; *see also* MONTI ET AL., *supra* note 21, at 10 (noting that "immigrants are one of the 'crown jewels' of the nation's innovative contributions to the global economy").

development, and they have set out to build more knowledge-intensive economies in which research, its commercial exploitation, and intellectual work would play a growing role.”³⁹ They have opened their markets to trade and foreign investment, improved relevant infrastructures, stimulated research and development, and expanded higher education thereby producing more scientists and engineers.⁴⁰ China and developing countries in Asia have been particularly aggressive in these fields, as have Brazil and South Africa.⁴¹ There is also more intense competition from the European Union, Israel, Canada, and Australia.⁴²

An objective indicator of these developments is North America’s declining share of global research and development activity, which dropped from 40% to 35% between 1996 and 2007.⁴³ The European Union’s share also dropped, but only 3%—from 31% to 28%.⁴⁴ The Asia/Pacific region benefited from (or helped contribute to) these declines by increasing its share from 24% to 31%, even while Japan experienced comparatively little growth.⁴⁵ The rest of the world grew its share of research and development activity by 20%, expanding from 5% to 6%.⁴⁶ The quantities of researchers, patenting activity, and degree production all tell a similar story.⁴⁷

In addition, other nations’ policies are often more welcoming of HSIs and less restrictive than those of the United States.⁴⁸ For instance, Canada, Australia, Japan, the United Kingdom, Germany, parts of the European Union, and other countries have streamlined their processes for hiring foreign workers and potential entrepreneurs, thereby luring many of them away

39. NAT’L SCI. FOUND., *supra* note 32, at O-3.

40. *Id.*

41. *See id.*

42. *See id.*

43. *See id.* at O-6 fig.O-5.

44. *Id.*

45. *See id.*

46. *Id.*

47. The United States, European Union, and China each had about 1.4 million researchers in 2007. *See* NAT’L SCI. FOUND., *supra* note 32, at 3-8, 3-48. The number of researchers in the United States and European Union grew by about 40% between 1995 and 2007; but the number of researchers in China during these years grew by 173%. *Id.* The number of researchers in Japan rose by only 5%. *Id.* Moreover, in 2009, non-natives obtained more patents than did Americans. *See* WEST, *supra* note 16, at 129. Degree production in science and engineering fields is following similar patterns, with only 16% of U.S. students receiving science or engineering degrees, compared to 38% of students in Korea, 33% of students in Germany, 28% of students in France, 27% of students in England, and 26% of students in Japan. *Id.* at 130.

48. *See, e.g.,* Edward Alden, *U.S. Losing Ground in Competitive Immigration*, WORLD POLITICS REVIEW (July 27, 2010), <http://www.worldpoliticsreview.com/articles/6142/u-s-losing-ground-in-competitive-immigration>.

from the United States.⁴⁹ Some countries have created special visa and entry requirements for immigrants who may be entrepreneurs.⁵⁰ Others are focusing on reducing barriers for HSIs to enter their workforce.⁵¹

The United States is no longer the only or even primary place for HSIs to find work or to start and grow companies.⁵² Increasingly, foreign-born students and workers return to their home countries for reasons that include sophisticated work (including primary research and development in such industries as aerospace, medical devices, pharmaceuticals, and software),⁵³ an increased demand for their skills,⁵⁴ a belief that their home country offers better career opportunities,⁵⁵ a belief that the U.S. economy will soon lag behind global growth rates,⁵⁶ and a higher standard of living and social status for successful people, as compared with the U.S. standard.⁵⁷

China and India are rapidly growing their economies and creating new personal and professional opportunities.⁵⁸ Many other countries are also attracting HSIs away from the United States.⁵⁹ United States policies and procedures must adapt to this new reality and recognize that the U.S. and

49. See NAT'L SCI. FOUND., *supra* note 32, at 3-51, 3-58; ANDERSON & PLATZER, *supra* note 5, at 27; ORRENIUS & ZAVODNY, *supra* note 15, at 54-55, 68; Schuetze & Antecol, *supra* note 25, at 110-12, 129; George J. Borjas, *Let's Be Clear About Whom We Want to Let In*, WASH. POST, Dec. 23, 2001, at B2 [hereinafter Borjas, *Let's Be Clear*]; Review & Outlook, *The Other Immigrants: Low Quotas, Long Lines Hurt U.S. Competition for Human Capital*, WALL ST. J., Nov. 18, 2009, at A18; see also LESLEYANNE HAWTHORNE, MIGRATION POL'Y INST., THE GROWING GLOBAL DEMAND FOR STUDENTS AS SKILLED MIGRANTS 1, 12 (2008).

50. See Schuetze & Antecol, *supra* note 25, at 110-12.

51. See NAT'L SCI. FOUND., *supra* note 32, at 3-51, 3-58; ANDERSON & PLATZER, *supra* note 5, at 27; Review & Outlook, *supra* note 49; Schuck, *Morality*, *supra* note 37, at 888; Schuetze & Antecol, *supra* note 25, at 107.

52. See Wadhwa, *Reverse Brain Drain*, *supra* note 19, at 45, 52; see also HERMAN & SMITH, *supra* note 1, at 145-46; Kaushal & Fix, *supra* note 10, at 2, 16; Review & Outlook, *supra* note 49.

53. See Wadhwa, *Reverse Brain Drain*, *supra* note 19, at 46.

54. WADHWA, ENTREPRENEURS, PART IV, *supra* note 35, at 3.

55. *Id.* at 3, 4, 18; see also HERMAN & SMITH, *supra* note 1, at 146; Alden, *supra* note 48, at 3.

56. WADHWA, ENTREPRENEURS, PART IV, *supra* note 35, at 3, 4, 18; see also HERMAN & SMITH, *supra* note 1, at 146.

57. See Alden, *supra* note 48.

58. See HERMAN & SMITH, *supra* note 1, at 145; see also Gerry Kerr & Francine K. Schlosser, *The Progression of International Students into Transnational Entrepreneurs: A Conceptual Framework*, in TRANSNATIONAL AND IMMIGRANT ENTREPRENEURSHIP IN A GLOBALIZED WORLD 122, 138 (Benson Honig et al. eds., 2010); Wadhwa, *Reverse Brain Drain*, *supra* note 19, at 49; Alden, *supra* note 48.

59. See, e.g., ANDERSON & PLATZER, *supra* note 5, at 22; Alden, *supra* note 48.

global economic pies are not stagnant. We can no longer satisfy our unfulfilled high-skill labor and innovation needs at our will and discretion.⁶⁰

Notwithstanding the above, the United States need not take a wholly negative view of worldwide competition. The global marketplace is not a zero sum game where every winner must impose a toll on a corresponding loser. Instead, our economy and that of other countries can expand and grow. In doing so, it can create complementary new jobs, innovations, and opportunities. For example, HSIs to the United States not only bring their knowledge, talent, and enterprise; they also bring connections and networks from their home countries, and opportunities for U.S. companies to possibly operate more efficiently, provide knowledge-based services, and reach new markets.

Healthy, robust, entrepreneurial economies around the world may presage greater political stability there, relieving the strain on U.S. economic and other resources. Because the world looks to America as an engine for its own economic growth, global competition can benefit the United States and its enterprises. Our policy should cultivate those benefits while preserving and pursuing national economic interests. Our immigration policies can either facilitate or inhibit America's economic strength and leadership;⁶¹ the status quo is inhibiting it.

C. U.S. Demand for Highly Skilled Labor

Many in the U.S. workforce dedicated to STEM careers and industries are approaching retirement and will begin doing so at increasing rates.⁶² At the same time, job growth in STEM fields is expanding.⁶³ In addition, the

60. See NAT'L SCI. FOUND., *supra* note 32, at 3-50; DEMETRIOS G. PAPADEMETRIOU & STEPHEN YALE-LOEHR, *BALANCING INTERESTS: RETHINKING U.S. SELECTION OF SKILLED IMMIGRANTS* iii (1996) [hereinafter PAPADEMETRIOU & YALE-LOEHR, *BALANCING INTERESTS*]; DEMETRIOS G. PAPADEMETRIOU ET AL., *MIGRATION POL'Y INST., ALIGNING TEMPORARY IMMIGRATION VISAS WITH U.S. LABOR MARKET NEEDS: THE CASE FOR A NEW SYSTEM OF PROVISIONAL VISAS* 11 (2009) [hereinafter PAPADEMETRIOU ET AL., *PROVISIONAL VISAS*].

61. See Schuck, *Morality*, *supra* note 37, at 897.

62. See NAT'L SCI. FOUND., *supra* note 32, at 3-29, 3-29 fig.3-21. According to the Scientists and Engineers Statistical Data System (SESTAT), people over age sixty-five comprised just below 9% of the science and engineering (S&E) labor force in 2003; people between ages sixty and sixty-four comprised just over 6% of the labor force; people between ages fifty and fifty-nine comprised just over 9%; and people between ages fifty and fifty-four comprised just over 12% of that work force. See *id.* That is, about 15% of the scientists and engineers in the U.S. workforce in 2003 were in their sixties. More than 24% were within ten years of or were over age sixty-five, and more than one-third were over age fifty.

63. See *id.* at 3-14. A recent report from the National Science Foundation (NSF) found "disjunction between [science and engineering] occupations and [science and engineering] degrees." *Id.* at 3-13. The NSF reported that "degree production in all broad categories of science and engineering fields rose at a slower pace than employment in [science and engi-

demand for STEM jobs prior to the “Great Recession” had been increasing.⁶⁴ Consequently, the United States needs to ensure that we at least replenish, if not grow, the pool of talent to provide the requisite skills, education, and experience on which those careers and industries depend. Moreover, the United States needs to consider those industries and careers that have not yet been created but that are or will soon be in development. Companies will find these skills and talents by hiring highly skilled native-born workers in the United States, bringing highly skilled foreign-born people to jobs in the United States, and/or hiring highly skilled foreign-born people to work at locations outside of the United States.⁶⁵

If current statistics are an indicator, most of these jobs will require higher education,⁶⁶ and businesses will hire foreign-born people to meet those needs if there is not enough native-born talent to do so.⁶⁷

The U.S. system of higher education is highly regarded globally and continues to provide foreign-born talent to help fill the demand for highly skilled labor.⁶⁸ This is particularly true in electrical engineering, where

neering] jobs.” *Id.* at 3-11. Between 1980 and 2000, relevant degree production grew at an annual rate of only one-third that of the growth rate for relevant jobs. *Id.* at 3-13.

64. Occupational Employment Statistics (OES) has estimated that S&E jobs grew by almost 10% between May 2004 and May 2007 for an annual growth rate of 3.2%—double the rate for all jobs generally. *See id.* at 3-11. OES projects that jobs in S&E will continue to outpace the growth rate of jobs in the total workforce, a trend that can be traced through the 1960s, 1980s, and 1990s during which S&E jobs grew at three times the rate of the overall workforce. *See id.* The Bureau of Labor Statistics projects the growth rate in this sector to be twice that of total job growth between 2006 and 2016. *See id.* at 3-15, 3-14 fig.3-A.

Also relevant to this discussion are the performances of U.S. education systems that feed U.S. colleges. Unfortunately, there is much room and need to improve those systems. One study of combined math and science literacy among fifteen years olds ranked the U.S. twenty-first among thirty countries. *See* TAPPING AMERICA’S POTENTIAL (TAP), GAINING MOMENTUM, LOSING GROUND 9 (2008), *available at* http://www.tap2015.org/news/tap_2008_progress.pdf. Another study ranked U.S. eighth grade students ninth in science and fifteenth in mathematics. NORMAN AUGUSTINE, IS AMERICA FALLING OFF THE FLAT EARTH? 31 (2007), *available at* http://www.nap.edu/openbook.php?record_id=12021&page=31.

65. NAT’L SCI. FOUND., *supra* note 32, at 3-13.

66. Between 44% and 53% of those working in S&E jobs have a bachelor’s degree as their highest degree, about 30% have advanced degrees, and between 7% and 12% have doctorate degrees. *See id.* at 3-6, 3-16 & fig.3-5. Using 2003 data regarding holders of doctorate degrees, SESTAT reports put the number at 51% of engineers and 48% of those working in math and computer science. *See id.* at 3-50. These numbers show increases from ten years earlier, when the percentages were 41% and 33%, respectively. *See id.*

67. The NSF reports that in 2003 about 25% of the college graduates working in S&E jobs were foreign-born. *Id.* at 3-7. That rate rose to 40% for those with doctorates. *Id.* Herman and Smith report that the rate of foreign-born holders of S&E doctorate degrees is nearly half. HERMAN & SMITH, *supra* note 1, at 63.

68. About two-thirds of all S&E doctoral candidates at U.S. universities in 2008 were foreign-born. HERMAN & SMITH, *supra* note 1, at 143. About 60% of engineering doctorates

about half of master's degrees and two-thirds of doctorate recipients in the U.S. are foreign-born.⁶⁹ Over half of doctorates bestowed in the natural sciences and engineering are to foreign-born recipients.⁷⁰ Regardless of the specific numbers and the details of nomenclature, foreign-born people earn a disproportionate and substantially large number of the STEM doctorate and other graduate degrees awarded by U.S. universities.⁷¹ Generally, in any given year there are between one-half and two-thirds of foreign-born graduate students at U.S. universities studying electrical engineering, computer science, and other STEM fields.⁷²

United States policy must be re-evaluated to recognize these foreign-born people as assets and engines for innovation, economic growth, advances in human welfare, and jobs. If we do not recognize them as such, and continue advancing the economic and creative potential of other nations, we will find these U.S.-educated graduates continuing to operate businesses that compete with U.S. business or jobs by providing outsourced labor in other countries that are better positioned than ever to take advantage of our situation.⁷³

and 50% of doctorates in engineering, math, computer science, physics, and economics were foreign-born. VIVEK WADHWA ET AL., *LOSING THE WORLD'S BEST AND BRIGHTEST: AMERICA'S NEW IMMIGRANT ENTREPRENEURS*, PART V, at 1 (2009) [hereinafter WADHWA, *ENTREPRENEURS*, PART V] (citing NAT'L SCI. FOUND., NSB 08-01, *SCIENCE AND ENGINEERING INDICATORS* 2008); see also Addison Wiggin, *The First American Brain Drain*, *THE DAILY RECKONING* (Mar. 15, 2010, 2:00 PM), <http://dailyreckoning.com/the-first-american-brain-drain/print/>.

69. In 2007, U.S. universities awarded 50% of master's degrees and 73% of doctorates in electrical engineering to foreign-born students. *H-1B Visas by the Numbers*, *supra* note 19 (citing NAT'L SCI. FOUND. & NAT'L INSTS. OF HEALTH, *SURVEY OF GRADUATE STUDENTS AND POSTDOCTORATES IN SCIENCE AND ENGINEERING*, *WEBCASPAR* (last updated May 2010), <http://webcaspar.nsf.gov>). In 2006, that percentage was about 40% for engineering master's degrees and about 60% for doctorate degrees, which roughly parallels the rates for degrees awarded in 2004. Wadhwa, *Reverse Brain Drain*, *supra* note 19, at 50; Wadhwa, *Skilled Immigration*, *supra* note 4, at 11 (citing MICHAEL T. GIBBONS, AM. SOC'Y FOR ENG'G EDUC., *ENGINEERING BY THE NUMBERS* (2007)). Degrees awarded in 2005 differed slightly, with 55% of master's degrees and 67% of doctorates in electrical engineering going to foreign-born students. ANDERSON & PLATZER, *supra* note 5, at 27. The consistency of these numbers dates to at least 1999, when people holding temporary or permanent visas earned 51% of the engineering doctorates awarded by U.S. universities. NAT'L SCI. FOUND., *supra* note 32, at O-7.

70. NAT'L SCI. FOUND., *supra* note 32, at O-7.

71. HUNT & GAUTHIER-LOISELLE, Abstract, *supra* note 3 (citing U.S. CENSUS BUREAU, *NATIONAL SURVEY OF COLLEGE GRADUATES* (2003)).

72. ANDERSON & PLATZER, *supra* note 5, at 27.

73. See WADHWA, *ENTREPRENEURS*, PART IV, *supra* note 35, at 8; Wadhwa, *Reverse Brain Drain*, *supra* note 19, at 46.

II. A SUMMARY OF CURRENT U.S. POLICIES REGARDING HSIS

In this section we present an overview of and assess current U.S. immigration policies regarding HSIs. The most relevant visa programs for HSIs to work or start businesses in the United States are the H-1B (which provides for temporary, non-immigrant status with possible application for permanent residency) and the EB series (which permits permanent status).

A. H-1B Non-Immigrant, Temporary Visa Program

The H-1B is a temporary work visa for specialty jobs requiring theoretical and practical application of a body of specialized knowledge and requiring at least a bachelor's degree.⁷⁴ The visa requires a sponsoring employer and permits the holder to work in the United States for up to three years with the potential to renew once for an additional three years.⁷⁵ Recipients are determined on a first in-first out basis, or by a lottery when there are more applications filed prior to the beginning of the fiscal year than there are visas available.⁷⁶ After the term expires or if the worker leaves the original sponsoring employer and does not get new sponsorship, he or she must leave the country.⁷⁷ Since 1990, those receiving H-1B visas have been allowed to apply for permanent residency and then citizenship,⁷⁸ but they do not always receive one of the limited, more permanent visas.⁷⁹

Current law allocates 65,000 H-1B visas, with an additional 20,000 available since 2004, to those receiving advanced degrees from U.S. universities.⁸⁰ At different times, Congress has changed the cap in response to economic conditions. Table 1 reflects the cap change, as well as the number of H-1B visas issued.

74. See 8 U.S.C. § 1101(a)(15)(H)(i)(B) (2006).

75. See 8 U.S.C. § 1184(c), (g)(4) (2006); 8 C.F.R. § 214.2(h)(9)(iii)(A)(1) (2010); 20 C.F.R. § 655.731 (2010).

76. See Petitions Filed on Behalf of H-1B Temporary Workers Subject to or Exempt from the Annual Numerical Limitation, 73 Fed. Reg. 15,389, 15,389-90 (Mar. 24, 2008) (to be codified at 8 C.F.R. pt. 214); Press Release, U.S. Citizenship & Immigration Servs., USCIS Reaches FY 2009 H-1B Cap (Apr. 8, 2008), available at http://www.uscis.gov/files/article/H-1B_8Apr08.pdf.

77. See 8 U.S.C. § 1184(a), (n).

78. 8 U.S.C. § 1184(h).

79. *Id.*

80. *Id.* § 1184(g)(1)(A)(vii), (g)(5)(C).

Table 1. H-1B Visas Authorized and Issued by Fiscal Year (FY)⁸¹

| Fiscal Year | No. (per FY) of H-1B Visas Authorized | No. (per FY) of H-1B Visas Issued |
|-------------|---------------------------------------|-----------------------------------|
| 1990-1996 | 65,000 | Less than 65,000 |
| 1997-1998 | 65,000 | 65,000 |
| 1999-2000 | 115,000 | 115,000 |
| 2001 | 195,000 | 163,000 |
| 2002 | 195,000 | 79,100 |
| 2003 | 195,000 | 78,000 |
| 2004-2010 | 65,000 | 65,000 |

In each of the past seven years, and nine of the past eleven years, the allotment of H-1B visas has been exhausted before or shortly after the applicable fiscal year began.⁸² In each of the past three years, the quota was depleted before the fiscal year began.⁸³ About 163,000 applicants annually seek these visas, so demand overwhelms supply;⁸⁴ the annual quota is often exhausted within the first few months, if not sooner.⁸⁵ The current experience is somewhat different. As of October 15, 2010 only 42,800 H1-B visa petitions were filed under the first category (H-1B Regular Cap) and only 15,500 were filed under the second category (H-1B Master's Exemption Cap).⁸⁶ The recent economic downturn certainly explains part of this

81. See *H-1B Visas by the Numbers*, *supra* note 19, at 4-5 & tbl.1; Madeline Zavodny, *The H-1B Program and its Effects on Information Technology Workers*, ECON. REV.—FED. RES. BANK OF ATLANTA, July 1, 2003, at 1, 2 (2003); see also NAT'L SCI. FOUND., *supra* note 32, at 3-55; ANDERSON & PLATZER, *supra* note 5, at 21.

82. See ANDERSON & PLATZER, *supra* note 5, at 21; *H-1B Visas by the Numbers*, *supra* note 19, at 4.

83. See ANDERSON & PLATZER, *supra* note 5, at 21.

84. Vivek Wadhwa, *Work Visas: Lose the Lottery*, BUS. WK., Apr. 22, 2008 [hereinafter, Wadhwa, *Work Visas*], available at http://www.businessweek.com/technology/content/apr2008/tc20080421_944778.htm.

85. See ANDERSON & PLATZER, *supra* note 5, at 21.

86. *H-1B Fiscal Year (FY) 2011 Cap Season*, U.S. CITIZENSHIP AND IMMIGRATION SERVS., <http://www.uscis.gov/portal/site/uscis/menuitem> (follow "temporary workers" hyperlink; then follow "H-1B Specialty Occupations and Fashion Models" hyperlink; then

decline, but there was considerable dissatisfaction with the terms of the visa—especially but not only by congressional Democrats—even before the downturn.

For instance, labor unions opposed H1-B visas for a variety of reasons. The visa-holders, unions argued, not only compete with American workers but are also vulnerable to employer exploitation because the visas are temporary, can only be renewed with the employer's cooperation, may not lead to a green card and permanent employment, and do not allow spouses to work in the United States.

The most significant drawback, however, is that workers generally lack employment mobility, which some analysts have characterized as a form of indentured servitude.⁸⁷ It certainly interferes with efficient labor markets.⁸⁸ The visa-holder cannot change employers without initiating the entire process again and jeopardizing his presence in the United States, unless the worker convinces his or her new employer to sponsor him or her.⁸⁹ Those seeking permanent residency also depend on the sponsoring employer, and therefore may accept lower compensation, work longer hours, and tolerate otherwise unacceptable conditions and behavior by employers.⁹⁰

Some also argue that the H-1B program depresses wages by providing "cheap labor" that reduces compensation for native-workers in the same jobs.⁹¹ They also contend that holders of H-1B visas take jobs from Amer-

follow "H-1B Fiscal Year (FY) 2011 Cap Season" hyperlink on the top right); *see also supra* note 80 and accompanying text.

87. *See* Norman Matloff, *On the Need for Reform of the H-1B Non-Immigrant Work Visa in Computer-Related Occupations*, 36 U. MICH. J.L. REFORM 815, 817, 865-66 (2003) [hereinafter Matloff, *Reform*].

88. *See* PAPADEMETRIOU ET AL., PROVISIONAL VISAS, *supra* note 60, at i, 2.

89. *See* 8 U.S.C. § 1184(a), (n) (2006).

90. *See* ORRENIUS & ZAVODNY, *supra* note 15, at 9; PAPADEMETRIOU ET AL., PROVISIONAL VISAS, *supra* note 60, at 9, 12, 16; Matloff, *Reform*, *supra* note 87, at 865.

91. *See* Matloff, *Reform*, *supra* note 87, at 816, 870-80; Norman Matloff, *Should the U.S. Increase Its H-1B Visa Program? CON: Wages Belie Claims of a Labor Shortage*, S.F. CHRON., Dec. 7, 2006, at B7 [hereinafter Matloff, *Should the U.S. Increase*]; Huma Khan, *Shooting Itself in the Foot: Is U.S. Turning Away Entrepreneurs?*, ABC NEWS/POLITICS (Apr. 21, 2010), <http://abcnews.go.com/print?id=10428413>. *See generally* NORMAN MATLOFF, CTR. FOR IMMIGRATION STUDIES, BEST? BRIGHTEST? A GREEN CARD GIVEAWAY FOR FOREIGN GRADS WOULD BE UNWARRANTED (2006) [hereinafter MATLOFF, BEST? BRIGHTEST?], available at <http://www.cis.org/GreenCard-ForeignGraduates>.

Matloff relies on data that suggests starting salaries and later wages have been flat or falling for people with new bachelor's or master's degrees in computer science and electrical engineering. *See id.* at 3 figs.3 & 4; Matloff, *Should the U.S. Increase*, *supra*; *see also* NAT'L SCI. FOUND., *supra* note 32, at 3-57 tbl.3-56. He contends that this trend contradicts industry claims that post-graduate workers are in short supply, in which case Matloff believes wages would be rising. *See* MATLOFF, BEST? BRIGHTEST?, *supra*, at 3; Matloff, *Should the U.S. Increase*, *supra*; *see also* Matloff, *Reform*, *supra* note 87, at 861-64. Mat-

ican citizens,⁹² even though new H-1B visa holders constitute only 0.06% of a civilian workforce of 154 million.⁹³ Over six years and assuming efficient visa processing, there would be approximately 510,000 workers in the United States on H-1B visas at any given time—only about 0.3% of the U.S. civilian workforce. Consequently, the direct impact of H-1B visa holders on the overall civilian workforce is negligible. Indeed, these visas may actually create more jobs, as studies and commentaries report that employers hire an additional four or five people for each H-1B worker they hire.⁹⁴

Even more than suppress economic growth, the lack of mobility caused by the H-1B program inhibits H-1B visa-holders from starting and growing companies and creating new jobs, unless they can do so outside of their regular employment or employer sponsorship. The inability to fully focus on and dedicate time and attention to a new company limits prospects for success and growth.

On a related note, Republicans are concerned about the temporary nature and limited number of H-1B visas, and the uncertainty that these factors create for the workforce.⁹⁵ Employers like Google complain that the HSIs the company is most eager to recruit often resist petitioning for H-1B visas for this reason.⁹⁶ Both parties agree on the need to expand, and perhaps even uncap, the number of permanent visas for HSIs, particularly in STEM

loff joins the Programmers Guild and the AFL-CIO Department of Professional Employees in asserting that there is no shortage of engineers with graduate degrees. See MATLOFF, BEST? BRIGHTEST?, *supra*, at 2. He links the reportedly low wages to an abundance of qualified talent. See Matloff, *Should the U.S. Increase*, *supra*.

92. See MATLOFF, BEST? BRIGHTEST?, *supra* note 91, at 9; Matloff, *Reform*, *supra* note 87, at 818, 833-57; David Adams, *The Immigrant Answer to Recession*, PODER 360° (Apr. 30, 2010), http://www.poder360.com/article_detail.php?id_article=4207; Khan, *supra* note 91. See generally Norman Matloff, *Globalization and the American IT Worker*, 47 COMMS. ACM 27 (2004) [hereinafter Matloff, *Globalization*].

Matloff has argued that H-1B visa holders specifically take jobs from “older” Americans, that is, Americans over age thirty-five. MATLOFF, BEST? BRIGHTEST?, *supra* note 91, at 6-7, 9; Matloff, *Reform*, *supra* note 87, at 887-90. He points to data showing that about 50% of H-1B holders are under twenty-five years old; another 38% are between ages twenty-five and thirty; about 9% are between ages thirty and thirty-five; and about 3% are over age thirty-five. MATLOFF, BEST? BRIGHTEST?, *supra* note 91, at 8 fig.6; see also Matloff, *Reform*, *supra* note 87, at 893-94.

93. *H-1B Visas by the Numbers*, *supra* note 19, at 1, 6, 15.

94. HERMAN & SMITH, *supra* note 1, at 151; see also *H-1B Visas by the Numbers*, *supra* note 19, at 11; Kerr & Lincoln, *supra* note 3, at 13.

95. Interview with staff member, Subcomm. on Citizenship, Refugees, Immigr., and Border Sec. of the H. Comm. on the Judiciary (Aug. 5, 2010).

96. *Id.*

fields, and Congresswoman Zoe Lofgren is developing legislation to accomplish this.⁹⁷

B. EB Series Immigrant, Permanent Resident Visa Program

The EB visa series consists of five categories. The EB-1 targets “priority workers” who meet one of three criteria.⁹⁸ The EB-2 applies to professionals with advanced degrees or people with exceptional ability who satisfy one of three criteria.⁹⁹ The EB-3 covers skilled or professional workers who have a bachelor’s degree but are not otherwise qualified for a higher preference category, skilled workers with a minimum of two years of training or experience, and unskilled workers.¹⁰⁰ The EB-4 allows permanent residence status for ministers and other religious workers.¹⁰¹

The EB-5 “investor” visa is available to people who invest at least \$1 million and create or sustain at least ten full-time jobs, or who invest \$500,000 in a “targeted employment area” and create or sustain ten jobs.¹⁰²

97. *Id.*

98. 8 U.S.C. § 1153(b)(1) (2006); 8 C.F.R. § 204.5(h)-(j) (2010). The EB-1 targets (1) people of extraordinary ability in sciences, arts, education, business, and athletics, (2) outstanding professors and researchers, and (3) managers and executives subject to international transfer. *Id.*

99. 8 U.S.C. § 1153(b)(2); 8 C.F.R. § 204.5(k). The EB-2 targets people with exceptional ability in sciences, arts, or business, advanced degree professionals, and qualified physicians who will practice in underserved areas of the United States. *Id.*

100. 8 U.S.C. § 1153(b)(3); 8 C.F.R. § 204.5(i)(2).

101. 8 U.S.C. § 1153(b)(4); 8 C.F.R. § 204.5(m)(5).

102. 8 U.S.C. § 1153(b)(5); 8 C.F.R. § 204.6(f). There is also a category of investor visas referred to as the E-2, which affords temporary, renewable status for any foreign-born person who satisfies certain screening requirements, invests an amount sufficient to successfully operate a business, hires U.S. citizens, is from one of the eighty countries with which the United States has a commercial treaty, and whose business has a “significant economic impact.” 8 U.S.C. § 1101(a)(15)(E)(ii) (2006); 8 C.F.R. § 214.2(e)(2)(ii) (2010). In addition, the sole purpose for coming to the United States must have been to direct and develop a “real operating commercial enterprise.” 8 U.S.C. § 1101(a)(15)(E)(ii); 8 C.F.R. § 214.2(e)(2)(ii). The holder of an E-2 visa is not eligible for permanent resident status and must establish intent to leave the United States as part of his or her application. 8 U.S.C. § 1101(a)(15)(E)(ii); 8 C.F.R. § 214.2(e)(2)(iii). There is no cap on the number of E-2 visas, but it is only valid for up to five years, and may be renewed indefinitely as long as eligibility continues and the treaty remains. See Nelson A. Castillo, *Gaining Access to the United States by Investing*, PODER 360° (Apr. 2010), http://www.poder360.com/article_detail.php?id_article=4207&pag=2. Approximately 150,000 holders of E-2 visas employ over one million Americans in the United States. Nina Mold, *Guest Commentary: New Visa Holders Won't Create More Jobs Than E-2 Investors*, NAPLES DAILY NEWS (Apr. 13, 2010, 5:25 PM), <http://www.naplesnews.com/news/2010/apr/13/guest-commentary-new-visa-holders-wont-create-more/>. Two notable differences between the EB-5 and E-2 visas are that E-2 visas are limited to treaty countries and do not allow the visa holder to petition for permanent residency.

The EB-5 also requires direct involvement by the investor in supervising the business operations.¹⁰³ Unlike the other EB categories, the EB-5 is a conditional visa that lasts for only two years.¹⁰⁴

No more than 7% of the EB series visas may go to citizens of any one country annually.¹⁰⁵ Therefore, countries like Malawi, Liechtenstein, Luxembourg, and Costa Rica are entitled to the same maximum number of EB series visas as India and China.¹⁰⁶

The United States issues approximately one million permanent resident visas ("green cards") each year.¹⁰⁷ Currently, about 40,000 visas are available for people with extraordinary abilities (EB-1), 40,000 visas are available for professionals with advanced degrees (EB-2), and 10,000 visas are available for investors (EB-5).¹⁰⁸ This is only about 9% of the annual allotment of permanent resident visas,¹⁰⁹ and these allotments must cover spouses and unmarried children.¹¹⁰ *The HSIs themselves only comprise an estimated one-third of the visa recipients in these categories—and a paltry 3% of the green cards issued annually.*

Compared with the U.S. workforce of 154 million people, the allotment of relevant EB visas increases that workforce by 0.08% each year. Considering the infusion of innovation, new firms, new jobs, and other benefits contributed by HSIs to the economy, this increase is vanishingly small and the foregone benefits (opportunity costs) correspondingly huge.

III. REFORMING U.S. POLICY REGARDING HSIS

The pace, strength, and magnitude of our innovation and economic growth will depend in part on U.S. policy regarding HSIs. A major constraint is that we allot a very large share of permanent visas to family

103. 8 U.S.C. § 1153(b)(5); 8 C.F.R. § 204.6.

104. 8 U.S.C. § 1153(b)(5); 8 C.F.R. § 204.6. The EB-5 also has a regional center pilot program in which 3000 of the EB-5 visas are reserved for investors targeting one of the ninety government-designated regional centers. Under this program, permanent residence is available as long as certain requirements are met and the conditional period is completed. 8 U.S.C. § 1153(b)(5); 8 C.F.R. § 204.6.

105. 8 U.S.C. § 1152(a)(2) (2006).

106. See HERMAN & SMITH, *supra* note 1, at 151.

107. *Id.* at 150.

108. See 8 U.S.C. § 1151(d) (providing for 140,000 employment-based visas annually); 8 U.S.C. § 1153(b) (allocating 28.6%, or about 40,000, visas to those who would be categorized as EB-1 and EB-2, and 7.1%, or about 10,000, visas to those who would be categorized as EB-5).

109. HERMAN & SMITH, *supra* note 1, at 150.

110. 8 U.S.C. § 1153(d); Castillo, *supra* note 102.

members without regard to their skills,¹¹¹ and we give only a small, negligible interest to highly skilled labor and the economic benefits it tends to produce.¹¹² Positively altering the trajectory of current policy trends regarding HSIs in order to maximize their potential contributions to U.S. innovation and economic growth requires new priorities, principles, and approaches. Merely tinkering around the edges may produce incremental improvements, but more far-reaching reforms are required to yield larger gains. More than family-oriented policies (and especially refugee and asylee policies), immigration policy that is oriented toward innovation, growth, and entrepreneurship can be measured in its effects, diversified in its targeting, and adapted to the changing macro-needs of our economy.

A. Reform U.S. Policy to Directly Target HSIs and Entrepreneurs

Below we discuss policy reforms with the greatest potential to attract and retain HSIs and the corresponding benefits for our economy and human welfare. These reforms include concerted efforts to permit recruiting of innovators and entrepreneurs either generally, or at least more specifically from among foreign-born graduates of U.S. universities, incorporation of a point and/or auction system, and new visa categories to target HSIs likely to create firms and jobs.

Several of the recommendations below suggest a new class of “provisional” visas that would permit the holder to enter, live, and work in the United States as long as he or she satisfied certain conditions, such as English fluency, a STEM graduate degree, and no criminal record. A worker could remain in the United States and automatically transition to permanent status after the passage of a specified period of time and the satisfaction of additional expectations—such as regular employment or starting and growing a business—some of which are discussed below. In the right situations, a provisional visa can be better than a temporary visa, which is characterized by uncertainty and delays in processing renewals (when available), and/or starting over when applying for permanent status. A provisional visa can also mediate societal risks associated with the automatic but seemingly unearned nature of immediately granting permanent status without better insight into the likelihood that the holder will contribute to instead of merely taking from society. Papademetriou and his colleagues advocate a provisional system that combines the H-1B and EB series 2 and 3 levels because a substantial percentage of EB series visas (90%) are awarded to

111. See PETER H. SCHUCK, *DIVERSITY IN AMERICA* 95 (2003) [hereinafter SCHUCK, *DIVERSITY*]; WEST, *supra* note 16, at xii, 23, 31, 126.

112. See ORRENIUS & ZAVODNY, *supra* note 15, at 7, 30; WEST, *supra* note 16, at xiii, 132; Borjas, *Let's Be Clear*, *supra* note 49; Alden, *supra* note 48.

workers adjusting from temporary status.¹¹³ Orrenius and Zavodny call for a system through which provisional visas are auctioned to employers.¹¹⁴

1. *Intensive Recruiting Efforts*

American states and local communities might be allowed to actively advertise for and recruit HSIs with preferred characteristics, experiences, and skills. For example, states may want to attract those with backgrounds in life sciences, clean energy, or other disciplines that may be important to their economic futures.¹¹⁵ The problem with this is that recruitment will be of limited use today so long as visa allotments for HSIs are as restricted as they currently are.

A related strategy might be to create a visa category more specifically designed to attract immigrants who have demonstrated entrepreneurial success or a capacity for scaling high-growth companies. Congress could create a provisional visa, with permanent status conditioned on satisfying specific criteria, such as experience starting and scaling companies that reach defined levels of revenue, profit, and employees, thus commercializing university research results to specified degrees of marketability or utility. Formal educational requirements for this visa should not exclude successful entrepreneurs who have followed non-traditional paths, but the criteria should be demanding and reasonably detailed so the visa is not available to just anyone but is still attainable for people with the intended experience and skills.

Relying on employers to recruit for innovation, as our current system does, may not by itself produce outcomes at the desired scale. After all, employers seek to fulfill their labor needs, which may or may not eventually lead to new companies and new jobs. The number of entrepreneurs to be recruited may not be large, although their effect on the economy is likely to be disproportionately great. In many ways, the recruiting efforts should focus less on individuals and more on the potential of people over time to contribute to and take advantage of the qualities of America that foster in-

113. See PAPADEMETRIOU ET AL., PROVISIONAL VISAS, *supra* note 60, at i, 14-15.

114. See ORRENIUS & ZAVODNY, *supra* note 15, at 70-97.

115. In fact, such recruitment overseas was common in the nineteenth century, when states advertised extensively in Europe to attract foreign workers. The immigration laws of 1864 allowed recruiting of contract labor. PAPADEMETRIOU ET AL., PROVISIONAL VISAS, *supra* note 60, at 4. See generally ARISTIDE R. ZOLBERG, A NATION BY DESIGN: IMMIGRATION POLICY IN THE FASHIONING OF AMERICA (2006) (discussing the history of American immigration from colonial periods to the present). To be sure, the skills these states sought to attract were much less developed, and states also recruited people in order to populate relatively empty continents.

novation and entrepreneurship, with the most likely of these people to be foreign graduates of U.S. universities.

2. *Recruit Graduates of U.S. Colleges and Universities*

Many advocates of economic growth propose allowing foreign-born graduates of U.S. universities to stay. These advocates include New York City Mayor Michael Bloomberg, Craig Barrett from Intel Corporation, United States Senators Schumer and Graham, Robert Litan and Tim Kane from the Kauffman Foundation, Vivek Wadhwa, and many others.¹¹⁶ The United States makes a substantial economic and knowledge investment in foreign students,¹¹⁷ and those students can contribute significantly to a pipeline of talent for high-skill labor, innovation, firms, and jobs.¹¹⁸ It is foolish and self-defeating that we do not reap the benefits of these high-quality American educations and experiences.¹¹⁹

In addition, economic communities and networks develop around strong academic programs and their graduates, both native- and foreign-born. Silicon Valley, Boston's Route 128, and the Research Triangle are only the best-known examples.¹²⁰ It harms the economy and communities to force foreign-born graduates of U.S. schools to abandon their professional communities, which are then denied the fruits of their investments in educating them.

Therefore, foreign-born persons who earn a graduate degree from a U.S. university, particularly in a STEM discipline, should receive a green card or at least a provisional visa, as described in the introduction to this section, if they meet other minimal criteria designed to ensure their assimilation and contributions, such as English fluency and no criminal record. At a minimum, degree recipients should have more than one year after graduation

116. See HERMAN & SMITH, *supra* note 1, at 143, 153; WADHWA, *ENTREPRENEURS*, PART V, *supra* note 68, at 5; WEST, *supra* note 16, at 135; Kerr & Schlosser, *supra* note 58, at 122-38. See generally Adams, *supra* note 92; Alden, *supra* note 48; Huma Khan, *supra* note 91.

117. For instance, regardless of citizenship, graduate students can generally receive free tuition to Ph.D. programs, grants for research, and funding for teaching positions. See MONTI ET AL., *supra* note 21, at 1; WEST, *supra* note 16, at 13, 37, 135, 136; Borjas, *Foreign Students*, *supra* note 10, at 10, 15.

118. WEST, *supra* note 16, at 14, 135.

119. This is particularly true with regard to knowledge, experience, and information that could affect national security, such as the study of such disciplines as nuclear and organic chemistry, chemical and nuclear engineering, and atomic and nuclear physics. See George J. Borjas, *Are Foreign Students Worth It? Is the International Open Door at Colleges and Universities Good or Bad for America? The Student Program is Deeply Flawed*, BOS. GLOBE, Sept. 15, 2002, at E12 [hereinafter Borjas, *Student Program*].

120. ORRENUS & ZAVODNY, *supra* note 15, at 49.

within which to qualify for alternative visa status by starting a company, creating jobs, working in a STEM job, or an alternative.

Variations on this theme could better target those who are most likely to advance innovation and economic growth. For instance, the STAPLE Act, introduced by Congressman Robert Flake from Arizona, proposes visas for those who earn a doctorate from a U.S. university in various STEM disciplines.¹²¹ Given the disproportionate number of foreign-born people who have or are currently receiving doctorates, who have founded STEM-oriented firms in the United States, or who work at STEM-based firms,¹²² this approach could be fruitful. Another variation would extend the visa to those who earn a master's degree in a STEM discipline from a U.S. university, because foreign-born people with either master's or doctorate degrees in science or engineering are more likely to be involved with patenting activity.¹²³ This could give new choices to the almost 260,000 foreign-born students who were enrolled at various stages of graduate STEM programs at U.S. universities in the 2005-2006 academic year,¹²⁴ and corresponding opportunities for employers, innovation, and business starts and growth for the U.S. economy.

Another variant would have provided temporary status to foreign-born people who earn a degree from a U.S. university in engineering or the physical sciences. A new visa class, F-4, would have allowed transitions to permanent status after three years if the visa-holder had worked in his or her discipline for that time.¹²⁵ Unlike the H-1B, the F-4 would not have depended on a specific employer's sponsorship and job offer in the United States and would have afforded greater mobility for the visa-holder to change jobs.¹²⁶ Still, the proposed F-4 suffered from a lack of clarity about what it means to "work" in the discipline during the temporary period. More specifically, it was unclear whether the proposed F-4 mandated limits or permitted a visa-holder to start and grow a business (or fail in attempts to grow a business) in the discipline.

121. H.R. 1791, 111th Cong. (2009); HERMAN & SMITH, *supra* note 1, at 153-54.

122. NAT'L SCI. FOUND., *supra* note 32, at 3-50, 3-55, 3-56; WADHWA, ENTREPRENEURS, PART II, *supra* note 4, at 2-3, 6 & fig.1, 13 fig.14; Kaushal & Fix, *supra* note 10, at 12; Kerr & Lincoln, *supra* note 3, at 1.

123. See HUNT & GAUTHIER-LOISELLE, *supra* note 3, at 13, tbl.1.

124. WADHWA ET AL., ENTREPRENEURS, PART III, *supra* note 16, at 27.

125. See MATLOFF, BEST? BRIGHTEST?, *supra* note 91.

126. See *id.* Nevertheless, a former employer could have still tried to influence others not to hire a former employee, threatened to do so, or otherwise made it difficult for a holder to change jobs. Offering recourse to U.S. courts for defamation, tortious interference, or other potential claims provides little comfort to a person who has been or is waiting to be deported.

A provisional visa for STEM-graduates, rather than a temporary visa, might be more politically attractive and practical. Even well-designed temporary visas can be unpredictable and subject to exploitation and abuse.¹²⁷ As discussed in Part III.A.5, temporary visas can also inhibit entrepreneurship. A provisional visa for graduates addresses those problems while also requiring that the graduate demonstrate that permanent residence is deserved. In this way, provisional visas balance against both the “supply shock” risk and the permanent increase in the labor market that accompanies an immediate green card.¹²⁸

If new visa categories for STEM graduates cannot clearly and easily lead to permanent residence, portability between employers or to entrepreneurship must, at a minimum, be permitted. While the H-1B limits portability partly to allow the sponsoring employer to recoup its expenditures in recruiting and bringing the immigrant to the United States, this rationale does not apply to the proposed new category. Portability to a new employer, at least for STEM graduates, will allow the labor market to operate more efficiently.¹²⁹ In addition, allowing portability to self-employment or entrepreneurship acknowledges that foreign students do not necessarily plan to start businesses at the outset but form the idea over time.¹³⁰

3. *A Point System*

Many immigration specialists and some legislators have advocated a system that awards points based on an applicant’s potential contributions to society in areas like economic growth.¹³¹ Such a system could be used to identify entrepreneurs in emerging strategic industries such as clean energy, biotechnologies, or nanotechnologies. In fact, other nations such as Canada, the United Kingdom, New Zealand, and Australia have been using point systems for decades to target and attract immigrant entrepreneurs and innovators.¹³² Thus, a point system could be particularly effective as the

127. PAPADEMETRIOU ET AL., PROVISIONAL VISAS, *supra* note 60, at 3 (discussing how it is difficult for employees with temporary visas to change employers).

128. Borjas, *Impact*, *supra* note 12, at 8.

129. PAPADEMETRIOU ET AL., PROVISIONAL VISAS, *supra* note 60, at 16.

130. Kerr & Schlosser, *supra* note 58, at 137.

131. *Examining Point Systems as a Method for Selecting Immigrants: Hearing Before the Subcomm. on Immigr., Citizenship, Refugees, Border Sec., and Int’l Law of the H. Comm. on the Judiciary*, 110th Cong. 5 (2007) (statement of Dr. Demetrios G. Papademetriou, President, Migration Policy Institute) [hereinafter Papademetriou, *Statement*]; PAPADEMETRIOU & YALE-LOEHR, BALANCING INTERESTS, *supra* note 60, at 198-200; SCHUCK, DIVERSITY, *supra* note 111, at 130.

132. Papademetriou, *Statement*, *supra* note 131, at 3, 6; PAPADEMETRIOU & YALE-LOEHR, BALANCING INTERESTS, *supra* note 60, at 126, 131; DEMETRIOS G. PAPADEMETRIOU, MIGRATION POL’Y INST., SELECTING ECONOMIC STREAM IMMIGRANTS THROUGH POINTS SYSTEMS

“race” for talent intensifies—as it is widely projected to do.¹³³ Nevertheless, Papademetriou, a leading scholar and advocate for such a system, cautions that point systems are not intended for governments to undertake job matching or to meet specific needs of individual employers within narrow timeframes.¹³⁴

In addition to conventional point categories such as educational attainment, a U.S. point system targeted at economic growth through innovation and entrepreneurship could award points and establish weights for specific attributes. These attributes might include: degrees specific to STEM disciplines, the nature of the degree (e.g., bachelor’s, master’s, doctorate), post-doctoral experiences, mentoring relationships and recommendations, previous time spent in the United States or engaged in U.S. business operations,¹³⁵ patent(s) applied for and received, license(s) granted or received (regardless of patenting activity), economic or humanitarian outcomes and effects of the license(s), and experience with beginning a business, attracting financing, putting together and working with a founding team, and/or growing and scaling a business.

A point system might also consider the viability of a business plan, as evidenced by enforceable capital or credit commitments, employees hired, and/or contracts with customers to purchase relevant goods or services. Applicants might even be awarded points based on the amount they or their sponsors are willing to pay the U.S. government for the visa—a suggestion at the heart of the visa auction proposal discussed below.

Among the advantages of a point system are the political confidence and appearance of impartiality inspired by the use of objective selection criteria and data readily tied to the economic and labor market, economic growth, and competitiveness objectives.¹³⁶ Among the disadvantages is an inability to adjust quickly to market changes and business cycles, at least as long as Congress retains responsibility for determining allocations, selection crite-

(2007) [hereinafter PAPADEMETRIOU, POINTS SYSTEMS], *available at* <http://www.migrationinformation.org/Feature/display.cfm?id=602>; Schuetze & Antecol, *supra* note 25, at 110.

133. Papademetriou, *Statement*, *supra* note 131.

134. *Id.*; PAPADEMETRIOU & YALE-LOEHR, BALANCING INTERESTS, *supra* note 60, at 30-31, 138.

135. Many of those who receive their first H-1B visas are already legally present in the United States for other purposes, particularly education. Zavodny, *supra* note 81, at 3. For instance, among H-1B visa holders in fiscal year 2006 with a professional degree, only 21% had a degree from a U.S. university; of those with master’s degrees, 52% had such a degree; and of those with doctoral degrees, 59% had a degree from a U.S. university. *See* NAT’L SCI. FOUND., *supra* note 32, at 3-55 to 3-56. Thus, although many H-1B holders had student visas for studying in the United States, a substantial number came specifically to work.

136. PAPADEMETRIOU, POINTS SYSTEMS, *supra* note 132.

ria, and value weightings.¹³⁷ This disadvantage could be minimized, however, if Congress authorized an agency to make these determinations based on existing and projected conditions.

4. *An Auction System*

Immigration visas are scarce resources that are worth a great deal of money to those who obtain them, particularly in light of visa-holders' general welfare in their countries of origin. Indeed, the truth is that these visas are windfalls to the immigrants who are fortunate and patient enough to win them over other applicants. As a matter of fairness, it is not at all clear why the full value of this windfall should go in the first instance to the immigrant; the society that enriches him or her, even as he or she is enriching it, has a strong claim to part of that value. In this spirit, a number of economists—most notably Gary Becker, Barry Chiswick, Richard Freeman, Gordon Hanson, and Julian Simon—have proposed auctioning visas to the highest bidders.¹³⁸ These bidders should satisfy other economic (e.g., minimum bids) and non-economic (e.g., non-criminal conduct) criteria.

Any such auction should be designed within certain fairness constraints;¹³⁹ it should be transparent, objective, well-defined, consistent, and credible. These features are all too lacking in the current system, which strongly favors those who happen to have family members, friends, and specialized lawyers already in the country.¹⁴⁰ Consequently, there is reason to believe that a well-designed auction will achieve at least as much equality as the current system.

The auction system should allow sponsors, employers, family members, and even humanitarian organizations to bid on behalf of individuals,¹⁴¹ or allow individuals to bid for themselves on behalf of their own entrepreneurial ventures.¹⁴² The government might even finance bids by low-income but credit-worthy, high-skill applicants out of a fund created from the auction proceeds.¹⁴³

137. ORRENIUS & ZAVODNY, *supra* note 15, at 99-100.

138. *Id.* at 86.

139. *Id.*; see SCHUCK, DIVERSITY, *supra* note 111, at 130.

140. See SCHUCK, DIVERSITY, *supra* note 111, at 130.

141. Peter H. Schuck, *Importing Diversity: Immigration* 56 (Yale Law Sch., Pub. Law & Legal Theory, Research Paper No. 21, 2002).

142. ORRENIUS & ZAVODNY, *supra* note 15, at 78-79.

143. See SCHUCK, DIVERSITY, *supra* note 111, at 130 (suggesting the government might finance bids for productive workers who cannot afford to bid on their own as a way to address fairness concerns).

Moreover, the bid amount need not be the only criterion in the awarding of visas. Depending on the weight society wishes to place on other criteria, the bid could be one factor among many. To ensure that visa-holders met minimum requirements, the system could have specified thresholds that would have to be met as a condition for the visa's validity.¹⁴⁴

Such a system would have several advantages. First, it would allow the market to value the underlying visa and opportunities it presents to different applicants—an attractive approach for a capitalist system. Second, the amount of each bid would reveal that bidder's self-assessed productive potential in the United States, an assessment backed by cash. The winners, then, are likely to be the most productive additions to the U.S. economy and society.¹⁴⁵ This information, along with other, non-economic information is socially valuable when it comes to selecting what is inevitably a limited number of immigrants.¹⁴⁶ Third, an auction would enable the government, and thus taxpayers, to recover the surplus—the difference between the cost of running the system and the value bidders place on the visas—while also shifting the costs to those who will benefit most from the visas in the first instance. Finally, the government could use auction proceeds to enhance efficiency in processing visas, along with other social purposes.¹⁴⁷

Critics may contend that an auction system would unfairly benefit those who have or can raise or finance the bid amount. Their rhetoric might depict the scheme as “selling the Statute of Liberty.” This is a critique, however, that already applies to the current system—a system which greatly advantages those who already have family members in the United States, contacts to find an employer-sponsor, and resources to hire an expert lawyer.¹⁴⁸ One way of meeting this objection—and a good idea in its own right—is to experiment with auctions by using them, at first, only for a limited number of visas rather than moving directly to an auction system for all visas. An obvious place to start would be to eliminate the current “diversity visa” category and allocate those 50,000 visas annually through an auction.¹⁴⁹

144. *Id.*

145. ORRENIUS & ZAVODNY, *supra* note 15, at 84, 111; SCHUCK, DIVERSITY, *supra* note 111, at 130-31.

146. See SCHUCK, DIVERSITY, *supra* note 111, at 130; see also ORRENIUS & ZAVODNY, *supra* note 15, at 71.

147. SCHUCK, DIVERSITY, *supra* note 111, at 130, 373 n.251.

148. *Id.* at 130.

149. See 8 U.S.C. § 1153(c) (2006); SCHUCK, DIVERSITY, *supra* note 111, at 130; see also discussion *infra* notes 173-77 and accompanying text.

5. *Start Up Visa Act*

Senators John Kerry and Richard Lugar introduced a bill in the 111th Congress to create an EB-6 category that grants two-year visas to immigrants who meet certain capital-raising thresholds from “qualified” venture capitalists or “super angels.”¹⁵⁰ Holders of this visa could qualify for permanent residency if they surpass additional capital-raising or revenue-generating benchmarks and add at least five full time jobs for non-family members.¹⁵¹ This visa would draw against the 10,000 visas allotted to the EB-5 investor visa.¹⁵²

The proposed Start Up Visa could be useful, but it is unlikely to have a lasting, material effect; nor is it likely to grow the economy or produce new jobs as well as other strategies would. For instance, at the outset, less than 1% of new businesses receive angel or venture capital investment.¹⁵³ Thus, the Act assumes a reasonably mature business, ready to operate in the United States, which is unusual. In fact, only about 16% of the fastest growing companies and less than 1% of the 600,000 companies started every year receive any venture capital funding at all.¹⁵⁴ The Act’s proposed requirements also assume the existence of a network that includes citizens who are, or have access to, venture capitalists or super angels even before the person arrives in the United States; this assumption further restricts the eligible applicant pool. In addition, the specific investment requirement gives the investor additional leverage over the entrepreneur to demand more favorable financial terms, ownership interest, and other provisions that might decrease an entrepreneur’s motivation.

Finally, temporary conditional visas may limit entrepreneurial activity by visa-holders for at least two reasons. First, the temporary status creates uncertainty for possible capital sources. Investors and creditors willing to accept normal market risks may be less inclined to tolerate enhanced risks of deportation or non-renewal if, for instance, the business hires only four employees or generates only \$950,000 in revenue, despite the fact that relatively arbitrary numerical standards may be necessary to support transparency, clarity, and consistency. Moreover, these additional risks of deportation and non-renewal may cause investors and creditors to charge a price premium or make other risk-reducing demands, which increases barriers to

150. Start Up Visa Act of 2010, S. 3029, 111th Cong.

151. *See id.*

152. *See id.*

153. *See* PAUL KEDROSKY, EWING MARION KAUFFMAN FOUND., RIGHT-SIZING THE U.S. VENTURE CAPITAL INDUSTRY 2 (2009).

154. *See* KEDROSKY, *supra* note 153; Robert E. Litan, *Visas for the Next Sergey Brin*, WALL ST. J., Mar. 8, 2010, at A19.

success and thus jeopardizes the visa-holder's prospects for permanent status.

Second, as noted earlier, very few new ventures succeed. About one-third of the 500,000 firms created each year will close within the first two years and only about 50% will make it to year five.¹⁵⁵ Temporary status or conditions based on success may perversely induce people to sustain failed businesses rather than move on to the next venture. Consequently, visas designed or intended to promote otherwise promising entrepreneurial activity should not unduly punish the prospects of failure beyond normal market conditions.

While the proposed Start Up Visa may provide some opportunities and even produce improvements, other paths seem more likely to maximize opportunities for HSIs to expand the U.S. economy and should be pursued in conjunction with, or in addition to, the Start Up Visa.

6. *A Job Creator Visa*

One better approach might be to remove the investment criteria from the Start Up Visa and focus on jobs created. For instance, Robert E. Litan proposes allowing H-1B or student visa-holders who establish a business to obtain another temporary visa.¹⁵⁶ This visa could be extended if the business hires at least one American non-family resident.¹⁵⁷ Litan proposes that the visa become permanent if the business passes a certain job threshold (e.g., five or ten workers).¹⁵⁸ An alternative strategy would be to provide such a provisional visa to job creators even if they are not already in the United States on H-1B or student visa.

Although this approach to staging conditions may suffer from some of the disadvantages discussed above, it does not unnecessarily tie the foreign-born entrepreneur to a single employer or even to the same employees. Nor does this approach restrict the applicant to starting only one company or keeping that company alive when the market otherwise suggests its demise. Making the visa provisional rather than temporary might make this visa more politically attractive.

B. **Improve Current Programs**

Although we advocate most strongly for reforming existing policy, even incremental changes such as increasing the number of available visas and

155. See STANGLER, *supra* note 29, at 7; STANGLER & LITAN, *supra* note 29, at 5, 11.

156. See Litan, *supra* note 154.

157. See *id.*

158. See *id.*

reducing processing times are better than a status quo that harms the economy and reduces potential job creation and innovation.¹⁵⁹

1. *Modify Allocations*

Congress currently permits an annual allocation of 65,000 visas for the H-1B¹⁶⁰ and 90,000 for the relevant EB series categories¹⁶¹ with no more than 7% going to citizens of any one country receiving EB series visas.¹⁶² In 2010, there are 163,000 applicants for the limited H-1B visas.¹⁶³ As of October 1, 2006, an estimated 500,000 principals and more than 500,000 “accompanying” family members were waiting for permanent residence visas to the United States.¹⁶⁴ Manifestly, the demand vastly exceeds supply. The resulting denials and delays represent significant opportunity costs.

Many analysts advocate increasing these allocations; the major question is—by how much? Congress raised the H-1B visa allotment to almost three times the current level before lowering it again in 2003.¹⁶⁵ It should consider returning to those higher levels or tying visa allotments to changes in the overall population or civilian workforce, whether total or employed, or to changes in the gross domestic product, which has risen 64% in the last two decades during which time the current EB levels were first established.¹⁶⁶

Hunt and Gauthier-Loiselle suggest that patent activity per capita could increase by 6% for every 1% increase in immigrant college graduates in the United States, and such activity could increase by 12% for every 1% in-

159. See ANDERSON & PLATZER, *supra* note 5, at 21. Representatives from one-third of surveyed publicly-held, venture capital-backed companies believed that the lack of H-1B visas influenced their decisions to place more employees outside the United States, and two-thirds of the respondents who used H-1B visas believed that current U.S. policies regarding H-1Bs “harm American competitiveness.” *Id.* at 7, 30.

160. See 8 U.S.C. § 1184(g)(1)(A)(vii) (2006).

161. See 8 U.S.C. § 1151(d) (2006) (providing for 140,000 employment-based visas annually); 8 U.S.C. § 1153(b) (2006) (allocating 28.6%, or about 40,000, visas to those who would be categorized as EB-1, 40,000 visas to those who would be categorized as EB-2, and 7.1%, or about 10,000, visas to those who would be categorized as EB-5, for a total of 90,000).

162. 8 U.S.C. § 1152(a)(2) (2006).

163. See Wadhwa, *Work Visas*, *supra* note 84.

164. See WADHWA, ENTREPRENEURS, PART III, *supra* note 16, at 26, 30; see also ORRENIUS & ZAVODNY, *supra* note 15, at 89.

165. See Zavodny, *supra* note 81, at 2; see also NAT’L SCI. FOUND., *supra* note 32, at 3-55; *H-1B Visas by the Numbers*, *supra* note 19, at 5 & tbl.1.

166. See *H-1B Visas by the Numbers*, *supra* note 19, at 4; see also ORRENIUS & ZAVODNY, *supra* note 15, at 34, 62; WEST, *supra* note 16, at 132, 148.

crease in foreign-born graduate degree recipients.¹⁶⁷ Maskus found that for every hundred foreign students who receive doctorates in science or engineering from a U.S. university, there are an additional sixty-two future patent applications.¹⁶⁸ This information supports targeting graduates of U.S. institutions and increasing the relevant allocation to make more room for these holders based on the likelihood of their innovation and patenting activity. Of course, any approach to expanding the allocation should account for the fact that the H-1B and EB series visas include the applicant and family members, not all of whom will work or contribute to patenting. Others have urged that the cap on H-1B visas be 110% of the preceding year's usage, and that the cap for EB series visas be 115% of the preceding year's usage.¹⁶⁹

Another numerical reform would be to remove or at least increase the 7% cap on immigrants from any one country receiving an EB series.¹⁷⁰ The substantially large populations of India and China, as compared to the rest of the world, and the large number of Indians and Chinese who study and work in the United States, particularly in the STEM disciplines, suggest that the ceiling, if retained, should be different for these and other similarly situated countries.¹⁷¹ As educational systems and business networks of other countries advance, raising or eliminating the cap for these countries or regions may also be appropriate. The best course overall would be to eliminate the country or regional caps for HSIs in order to attract skill sets, networks, and other capabilities intended to advance the U.S. economy. Restrictions by country or region perversely deny the United States access to contributions and innovations that those cut off by the cap would have made.¹⁷²

If there are concerns about increasing the number of immigrants beyond current allocations, additional room could be found by eliminating the so-called "diversity visa" program under which 50,000 visas per year are

167. See HUNT & GAUTHIER-LOISELLE, *supra* note 3, at 13-14, 20. This compares to an increase in patent activity per capita of only 3.5% for every 1% increase in native-born college graduates. See *id.* at 13. Stated differently, Hunt and Gauthier-Loiselle's research suggests a nearly two-fold increase in patent activity per capita by educated immigrants over their native-born peers. See *id.* at 10 tbl.1, 11, 20.

168. *H-1B Visas by the Numbers*, *supra* note 19, at 4 (citing Gnanaraj Chellaraj et al., *The Contribution of Skilled Immigration and International Graduate Students to U.S. Innovation* (World Bank Pol'y Res', Working Paper No. 3588, 2005)).

169. See PAPADEMETRIOU & YALE-LOEHR, *BALANCING INTERESTS*, *supra* note 60, at 175, 187.

170. See ORRENIUS & ZAVODNY, *supra* note 15, at 31-33.

171. See NAT'L SCI. FOUND., *supra* note 32, at O-7, 3-7, 3-52; see also Zavodny, *supra* note 81, at 2; Alden, *supra* note 48.

172. PAPADEMETRIOU & YALE-LOEHR, *BALANCING INTERESTS*, *supra* note 60, at 183.

available for applicants and their families from certain low-admission states and regions.¹⁷³ Advocates justify these visas as a way of redressing an “unfair imbalance between high-admission and low-admission regions and states,” but others point out that these visas actually cause the population to be less diverse than it might otherwise be, and that the program was designed to create a “new, white, European, English-speaking, largely Irish immigration stream to balance . . . the unexpectedly large non-white Asian and Latino migrations in the 1970s and 1980s.”¹⁷⁴

The “diversity visa” program suffers from other more practical problems that undermine its usefulness, particularly when balanced against the value of targeting HSIs and economic growth. First, diversity visa-holders often lack technical education or usable skills.¹⁷⁵ Second, these immigrants may lack any network or resources within the United States to help them acclimate and adjust to their new home.¹⁷⁶ These factors suggest that they and their families are less likely to contribute to economic growth. Finally, the program is also ripe for abuse through the submission of multiple applications under derivatives of the person’s name, use of falsified documents, sales of successful applications to others, and corrupt governments that may intercept and redistribute visas or destroy them.¹⁷⁷ Consequently, diversity visas are of doubtful economic, social, political, and ethical value. Those 50,000 visas could be better used to test some of the recommendations in this article.

Economic growth might also be encouraged by experimenting with a certain number of H-1B visas that would not be specifically tied to any particular employer. This change would not only address criticisms about H-1B holders being cheap, exploited workers and native wage depressors, but would also recognize that promotions, raises, and other indicia of upward mobility are now more frequently available across firms rather than within them.¹⁷⁸

173. See ORRENIUS & ZAVODNY, *supra* note 15, at 34; SCHUCK, DIVERSITY, *supra* note 111, at 130. See generally 8 U.S.C. § 1153(c) (2006).

174. SCHUCK, DIVERSITY, *supra* note 111, at 125-27.

175. See *id.* at 128-29.

176. See *id.* at 129.

177. See *id.* at 129-30.

178. See PAPADEMETRIOU & YALE-LOEHR, BALANCING INTERESTS, *supra* note 60, at 28.

2. Accelerate Processing

The processing time for green cards and temporary skills-based visas can take up to *twenty years*.¹⁷⁹ The uncertainty, unfairness, and inefficiency inherent in such long waits affect the would-be immigrants, their family members, employers, investors, creditors, and others, and surely inhibit innovative thinking and investment of human and financial capital in productive ways.¹⁸⁰ The wait also unnecessarily binds holders to the specific employers who sponsored their visas, thereby limiting their mobility and inhibiting innovation and entrepreneurial potential.

Processing times can be reduced by hiring more people, organizing them more efficiently, and updating technology. Increasing fees and revenue from point systems or auction programs could help defray the costs of a faster, more efficient system.¹⁸¹ At a minimum, for those already in the United States for a certain number of years, the time it takes to process a visa application should count toward the waiting period before which an immigrant may apply for citizenship.¹⁸² This policy would provide some reward for tolerating the delay and its effects.

CONCLUSION

A U.S. economy that needs innovation and economic growth is ill-served by laws, standards, and systems designed to further outdated goals and dubious immigration policies.¹⁸³ A blatant disconnect exists between our current HSI system and the demands of economic growth through innovation and entrepreneurship.

Yet, a vast number of HSIs are waiting to contribute to these goals. In many ways, HSIs are like low-hanging fruit. Why, then, have policymakers failed to reap these potential rewards? What is the source of lethargy and tolerance for an unambiguously deficient system? Policy regarding HSIs and the corresponding benefits for innovation, our economy, and human welfare should not be held hostage to the contingencies of reforming other parts of our immigration system.

Research could provide answers to these questions. Interviews with policymakers and their staffs can elucidate the political calculus of inaction

179. See *H-1B Visas by the Numbers*, *supra* note 19, at 1, 9, 15; see also WADHWA, ENTREPRENEURS, PART III, *supra* note 16, at 31.

180. See NAT'L SCI. FOUND., *supra* note 32, at 3-53; ANDERSON & PLATZER, *supra* note 5, at 22; PAPADEMETRIOU ET AL., PROVISIONAL VISAS, *supra* note 60, at 10-11, 16-17; WADHWA, ENTREPRENEURS, PART V, *supra* note 68, at 5; Alden, *supra* note 48.

181. See SCHUCK, DIVERSITY, *supra* note 111, at 130.

182. See NAT'L SCI. FOUND., *supra* note 32, at 3-53.

183. See PAPADEMETRIOU & YALE-LOEHR, BALANCING INTERESTS, *supra* note 60, at 7.

and the measures that might help to overcome it. Discussions with HSIs, both successful and unsuccessful, could be valuable in formulating new policies or better implementing existing ones. Interviews with entrepreneurs and investors who have scaled companies might also yield useful insights into the nature of the obstacles to growth erected by current immigration policies, and the desirability of various proposals for policy and administrative reforms, including those discussed in this article.

Immigration, particularly by HSIs, has been both “engine and fuel” for the U.S. economy, providing knowledge, technology, and even capital.¹⁸⁴ By invigorating national and global commerce and trade, HSIs contribute disproportionately to American jobs, wealth, and human welfare.¹⁸⁵ Our immigration policy should take better advantage of the opportunities HSIs present.

184. *See id.* at 37.

185. *See id.*